POLITEKNIK
MALAYSIA
SEBERANG PERAI

PROJECT 2

FINAL REPORT

TOY CAR VACUUM CLEANER

DEP 5A

NAME: YUVANDIRRAN S/O PUVANESVARAN 10DEP14F1085

: EIO SIN KHUANG 10DEP14F1091

COURSE CODE: DEE6092

LECTURER NAME: PUAN MASLIZA BINTI MASKIN

ANNOUNCEMENT

I hereby declare that this report is the results of my own work and research except for quotes and citied in the references.

.....

(YUVANDIRRAN S/O PUVANESVARAN)

DATE: 7 OKTOBER 2016

SIGNATURED BY SUPERVISIOUR PROJECT:

.....

PUAN MASLIZA BINTI MASKIN

DATE: 7 OKTOBER 2016

MASLIZA BINTI MASKIN
Pensyarah
Jabatan Kejuruteraan Elektrik
Politeknik Seberang Perai

ANNOUNCEMENT

I hereby declare that this report is the results of my own work and research except for quotes and citied in the references.

.....

(EIO SIN KHUANG)

DATE: 7 OKTOBER 2016

SIGNATURED BY SUPERVISIOUR PROJECT:

.....

PUAN MASLIZA BINTI MASKIN

DATE: 7 OKTOBER 2016

MASLIZA BINTI MASKIN
Pensyarah
Jabatan Kejuruteraan Elektrik
Politeknik Seberang Perai

ABSTRACT

This Project must be looked at and must be taken further in the near future the things which can be looked at in the near future are by the cleaning the vacuum pipe infrastructure to eliminate all possible blockages. Moreover, filter availability for vacuum pipes. Flexible pipes for vacuum cleaning on each level and connections to the vacuum pipe infrastructure. Only redoing one unit to the test for effectiveness. Finally, we can made a review the previous system worked perfectly. With improvements, a similar system will work ever better.

Projek ini perlu dilihat dan diambil lagi pada masa akan datang perkara-perkara yang boleh dilihat dalam masa terdekat adalah dengan pembersihan infrastruktur paip vakum untuk menghapuskan semua sekatan mungkin. Selain itu, ketersediaan penapis untuk paip vakum. paip fleksibel untuk pembersihan vakum pada setiap peringkat dan sambungan kepada infrastruktur paip vakum. Hanya membuat semula satu unit ke unit ujian untuk keberkesanan. Akhir sekali, kita boleh membuat kajian sistem lama bekerja dengan sempurna. Dengan penambahbaikan, sistem yang sama akan bekerja lebih baik sentiasa.

ACKNOWLEDGEMENT

First of all we would like to thank our supervisor, Puan MASLIZA BINTI MASKIN for the guidance and discussion during the project implementation. A lot of appreciation especially to families, friends and the lecturers that help us directly or indirectly in process of the project production.

Instead thanks for our parents that not forget to support us during our lesson and studies in Politechnic of SeberangPerai, especially during our project activities "TOY CAR VACUUM CLEANER".

Thanks to all that involved during the making our final year project "TOY CAR VACUUM CLEANER" successful.

TABLE OF CONTENTS

CHAPTER 3 METHODOLOGI

CHAPTER 4 RESULT AND ANALYSIS

CHAPTER 5 CANCLUSION AND RECOMMENDATIONS

FIGURE

TABLE

CHAPTER 1

INTRODUCTION

1.1 BACKROUND

In a family, cleaning is a very common but also is an important thing. If you do not deal with it, the whole floor in the house will full with dust, causing us uncomfortable. In this advanced era, the vacuum cleaner is a common machine, but it is also an expensive machine. So we made this toy car vacuum cleaner in the price of economic machines. It use radio frequency to control and does not require the use of plugs, only need to use the battery. We use the transmitter of remote control to send the signal to the receiver, so we can control the direction of the toy car. Our vacuum cleaner is made by using a simple method then the vacuum cleaner is installed to the toy car and it formed a toy car vacuum cleaner. This design is completed by using two difference design. The toy car vacuum cleaner's transmitter and receiver uses a frequency of 433HZ

A vacuum cleaner is a device that uses an air pump, to create a partial vacuum to suck up dust and dirt, usually from floors, and from other surfaces such as upholstery and draperies. The dirt is collected by either a dust bag or a cyclone for later disposal. Vacuum cleaners, which are used in homes probably, can trap all the tiny dusts. Children prefer to toy cars, while allowing them to pass the time. Based on these principles, we put the toy cars and vacuum cleaners combine to become a toy car vacuum cleaner, our toy car is the use of a wireless point, the purpose is to attract children to increase their interest in electronics

1.2 OBJECTIVE

The main objective of this project is to design and implement a toy car vacuum cleaner.

The project is aimed to meet the following objectives:

1. Increase the interest of children in electronics, so that they will want to learn more knowledge about it.

2. Can reduce burden of families, elderly.

3. Can help the person with disabilities to take care they housework.

The objective of this project is help to people with their disabilities. Besides, it makes human's job easier which can be controlled the toy car to be wiped the floor even under the sofa and we no need to be stoop. Otherwise, the children also can be play with toy car that we have been designed. Instead of, the toy car vacuum cleaner is designed small and it is convenient to bring out. Therefore, the smaller size makes them a great option for smaller living spaces, such as apartments, dorm rooms , where storage space is at a premium but you still want to be keep things clean. The main benefit of its smaller size, in my opinion, is that it makes cleaning difficult-to-reach places a snap. With kids, I find myself cleaning the most random spots with my handheld vacuum.

1.3 PROBLEM STATEMENT

In fact, most of us usually using sweep for cleaning. From time to time technology come up and need to upgrade. In addition, most of the people are working and they did not have enough time to clean. Furthermore, most of the designations of vacuum cleaner in the market are expensive and large in size. So it is difficult to clean anywhere, under beds or under chairs and tables.

1.4 PROBLEM SOLUTION

This project is helping them to clear dust in small place and we also installed a shell on the toy car to ensure that the child does not touch the wires inside. Our toy car vacuum cleaner is a economic project. Their child also can control to clean when busy.

1.5 PROJECT DESCRIPTION

This project is helping a family to clean up some small areas of dust. Under the bed, under the tables and chairs

1.6 RESEARCH QUESTION OF PROJECT

In the production process there will be many problems:

1. Signal problems between the transmitter and receiver
2. DC MOTOR direction problem
3. Vacuum cleaner problem
4. solder parts in the electric board
5. Use Proteus to design PCB layout

1.7 SCOPE AND LIMITATION OF PROJECT

Scope

This project is suitable for people to use in this place. The place is:

1. Outdoor (Can bring the toy car vacuum cleaner to play outside)
2. Indoor (Can control the toy car vacuum cleaner to clean in home)

Limitation

1. The distance of control 15meter.
2. Small in size and it is also portable.

1.8 SIGNIFICANT OF PROJECT

A toy car vacuum cleaner is able to suck dirt off carpet because high pressure air from outside it flows toward low pressure air inside. In an electric vacuum, a fan causes air inside the vacuum to move quickly, which lowers the air pressure, causing suction. The higher-pressure air from outside the vacuum is sucked in to replace the low-pressure air, bringing dirt and dust with it to be caught in the filter bag. (Learn more about how vacuums work.

Toy car vacuum cleaner for kids picks up small pieces of paper waste and other dust from the floor. This makes our kids to feel that they have done a great job in cleaning their house.

Design and operation are simple. On this principle, the child will help reduce the burden on the environment

CHAPTER 2

LITERATURE REVIEW

2.1 INTROFUCTION

In this section, we will discuss about and share about all the information that we obtain from the study and research which is vital for us to get the project done. From the research, we also obtain some knowledge theory base AND practically base which can be used for us to successfully complete this project and attaints' our objective. Majority materials are article, books, journals and previous work related to the project. The materials will be compiled and used as guidance for us to complete our projects.

From the research, it help us to determine the suitable components to be used as a parts of our projects. Since the components has a wide range of selection, the study will help us choose the best to make a good toy car vacuum cleaner.

2.2 WIRELESS REMOTE CONTROL TOY CAR

Remote controlled toys are any type of toy that can be controlled remotely. There are various types of toys, usually vehicles, that are remote controlled, such as cars, trucks, helicopters, boats, and even submarines.

There are four components of a remote controlled vehicle. The first component is the transmitter, which is the controller that the user has in their hand. This controller sends a signal, such as a radio wave, to the car. The receiver, such as an antenna and circuit board, sits inside of the toy and it takes the signal from the transmitter. When the receiver gets the signal, it activates motors inside the toy depending on the signal that the transmitter gives out. The motors inside of the toy are what allow the toy to be steered, to turn wheels, operate propellers, and do various other tasks. The final component of a remote controlled toy is the power source, which is usually a battery that is placed inside of the transmitter.

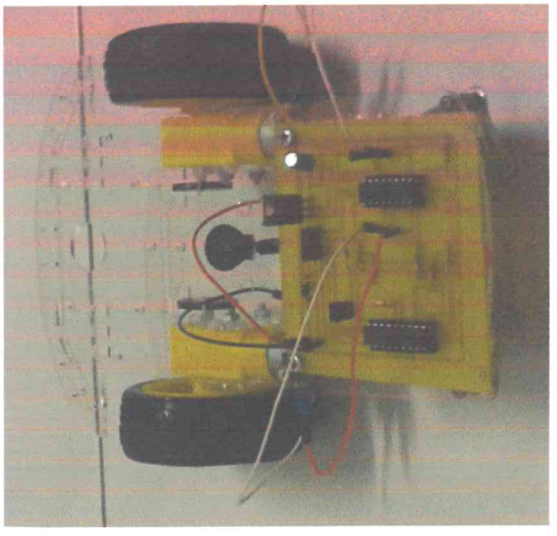


Figure 1

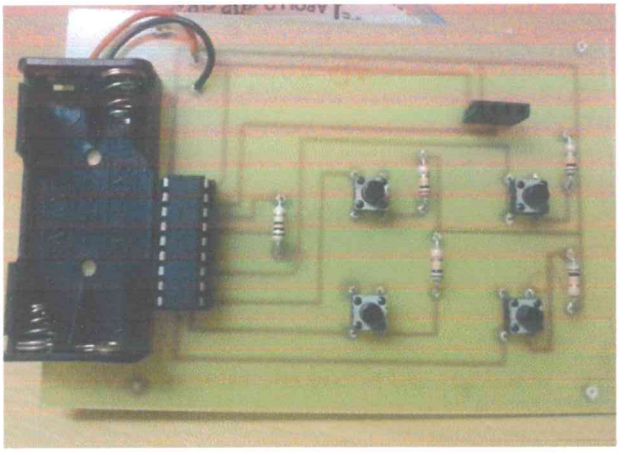


Figure 2

2.3 TRANSMITTER AND RECEIVER (433MHz))

The 433MHz RF Transmitter Receiver module is a wireless communication module that uses radio frequency (RF) as signal. It comes packaged as a separate transmitter and receiver. The receiver module can detect and output any radio signal in the 433 MHz range, whereas the transmitter can transmit a signal in this range via an input. Although I've seen some modules that can handle frequencies in the 315, 330 and 433 MHz ranges for the purpose of this post I am only going to work with the last frequency.

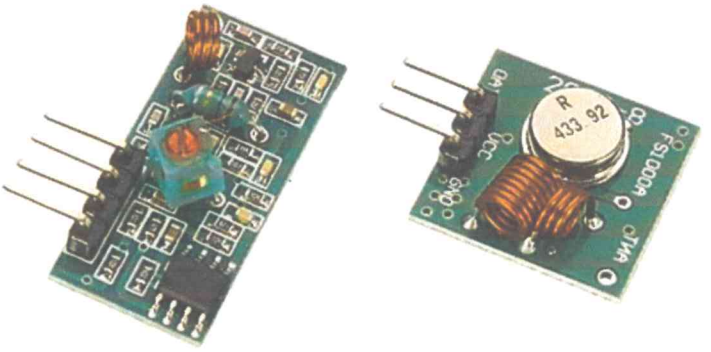


Figure 3

2.4 RADIO FREQUENCY

Radio frequency (RF) is any of the electromagnetic wave frequencies that lie in the range extending from around 3 kHz to300 GHz, which include those frequencies used for communications or radar signals. RF usually refers to electrical rather than mechanical oscillations. However, mechanical RF systems do exist (see mechanical filter and RF MEMS).

Although radio *frequency* is a rate of oscillation, the term "radio frequency" or its abbreviation "RF" are used as a synonym for radio – i.e., to describe the use of wireless communication, as opposed to communication via electric wires.

2.5 RADIO COMMUNICATION

To receive radio signals an antenna must be used. However, since the antenna will pick up thousands of radio signals at a time, a radio tuner is necessary to *tune into* a particular frequency (or frequency range). This is typically done via a resonator – in its simplest form, a circuit with a capacitor and an inductor form a tuned circuit. The resonator amplifies oscillations within a particular frequency band, while reducing oscillations at other frequencies outside the band. Another method to isolate a particular radio frequency is by oversampling (which gets a wide range of frequencies) and picking out the frequencies of interest, as done in software defined radio.

The distance over which radio communications is useful depends significantly on things other than wavelength, such as transmitter power, receiver quality, type, size, and height of antenna, mode of transmission, noise, and interfering signals. Ground waves,tropospheric scatter and sky waves can all achieve greater ranges than line-of-sight propagation. The study of radio propagation allows estimates of useful range to be made.

2.6 DC MOTORS

Electric motors use the forces produced by magnetic fields to produce a turning motion. If you put a length of wire in a magnetic field and pass a DC current through it (such as from a battery), the wire will move. This is called the motor effect.

To make a simple DC motor, you need:

1. two bar magnets
2. a coil of wire wrapped around something to support it
3. an axle for the coil of wire to spin around
4. two half rings ('split rings')

The two bar magnets are held so that the north pole of one magnet faces the south pole of the other magnet. The coil of wire is mounted in the gap between the two magnets. The split rings make electrical contact with the coil and reverse the current every half turn. When an electric current flows through the coil, a force is exerted on the coil, causing it to spin.

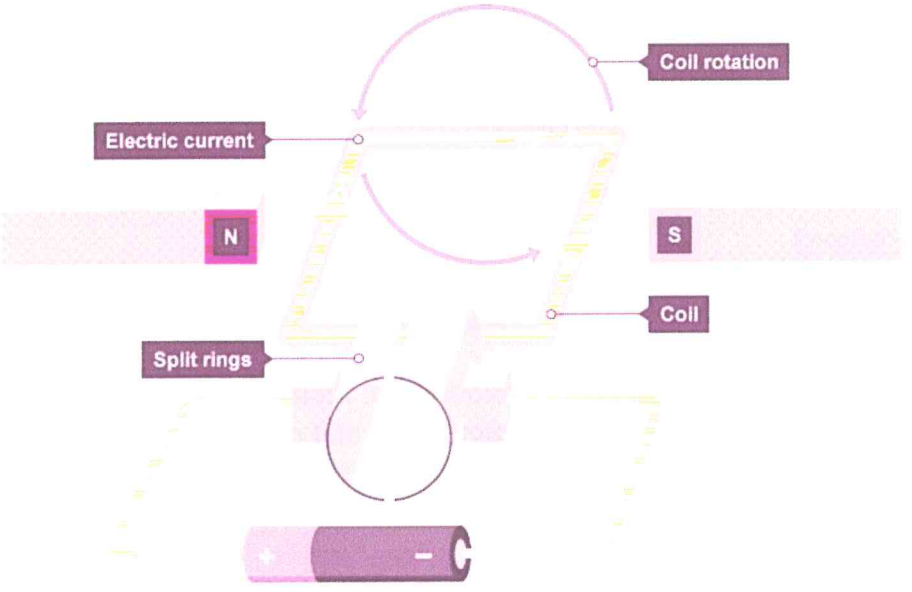


Figure 4

2.7 ENCODER AND DECODER

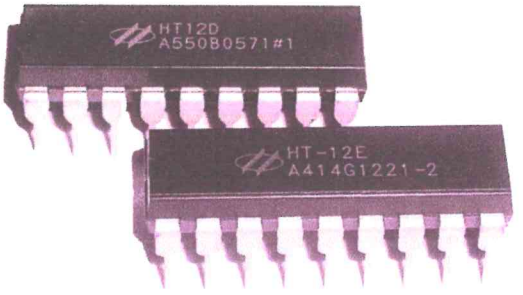


Figure 5

Encoder is the module which changes the stream of input bytes into output stream of bytes with added redundant bytes. Encoder module adds the redundancy as well as change the formats. Figure-1 depicts the encoder and decoder process and typical encoders and decoders available.

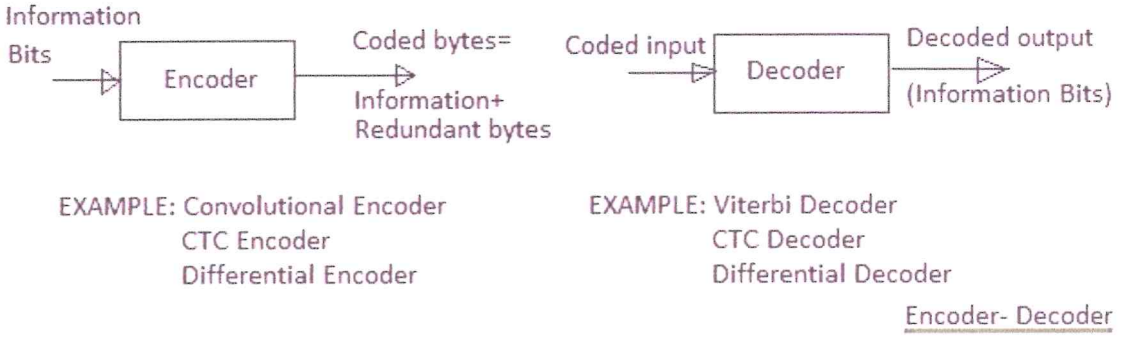


Figure 6

Decoder module utilizes redundant information present in the corrupt received vector to recover the original information bits which might have been transmitted.

2.8 Motor Driver IC L293D

A motor driver IC is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver ICs act as an interface between microprocessors in robots and the motors in the robot. The most commonly used motor driver IC's are from the L293 series such as L293D, L293NE, etc. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor. For this tutorial we will be referring the motor driver IC as L293D only. L293D has 16 pins, they are comprised as follows:

Ground Pins - 4
Input Pins - 4
Output Pins - 4
Enable pins - 2
Voltage Pins - 2

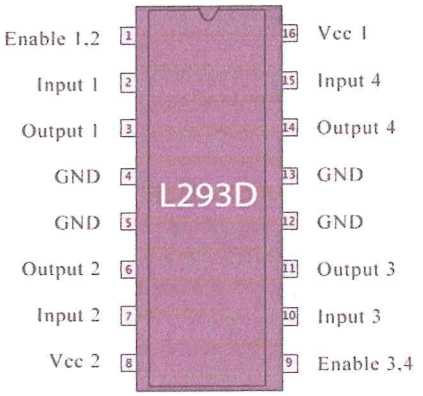


Figure 7

2.9 VACUUM CLEANER

A **vacuum cleaner**, also known as a **sweeper**, is a device that uses an air pump (a **centrifugal fan** in all but some of the very oldest models), to create a partial **vacuum** to **suck up dust** and dirt, usually from floors, and from other surfaces such as upholstery and draperies.

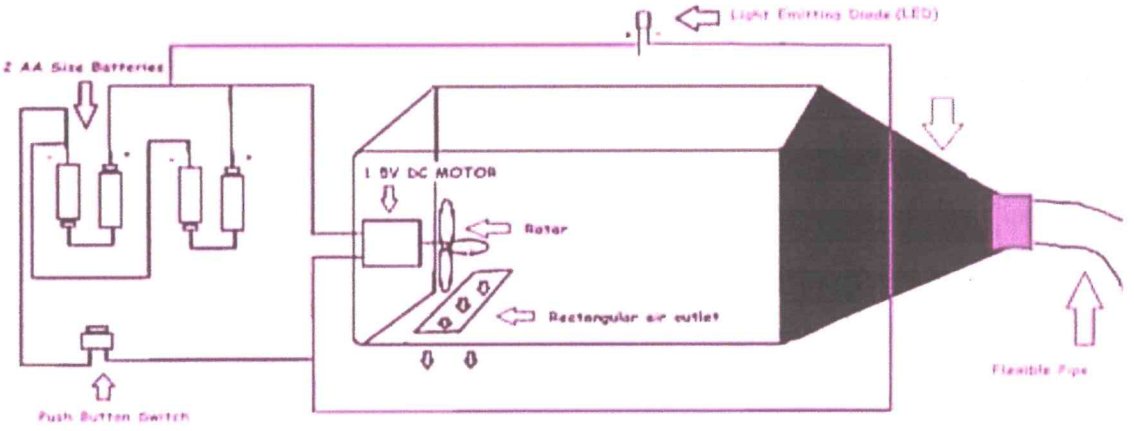


Figure 8

CHAPTER 3

Methodology

3.1 Method Used

This chapter will briefly discuss method used in order to do the project. The method is we are using radio frequency between remote control and toy car.

Block Diagram

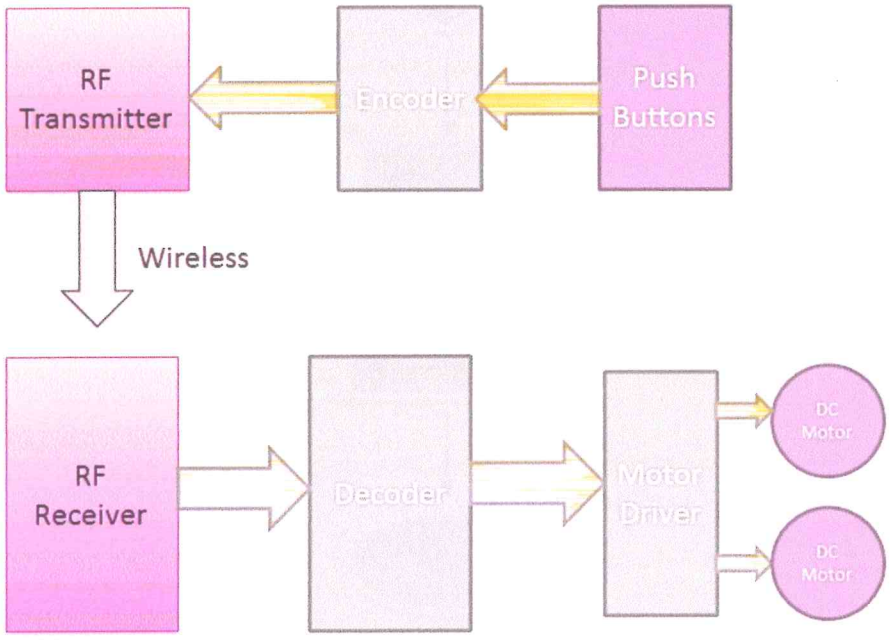


Figure 9

3.2 FLOW CHART

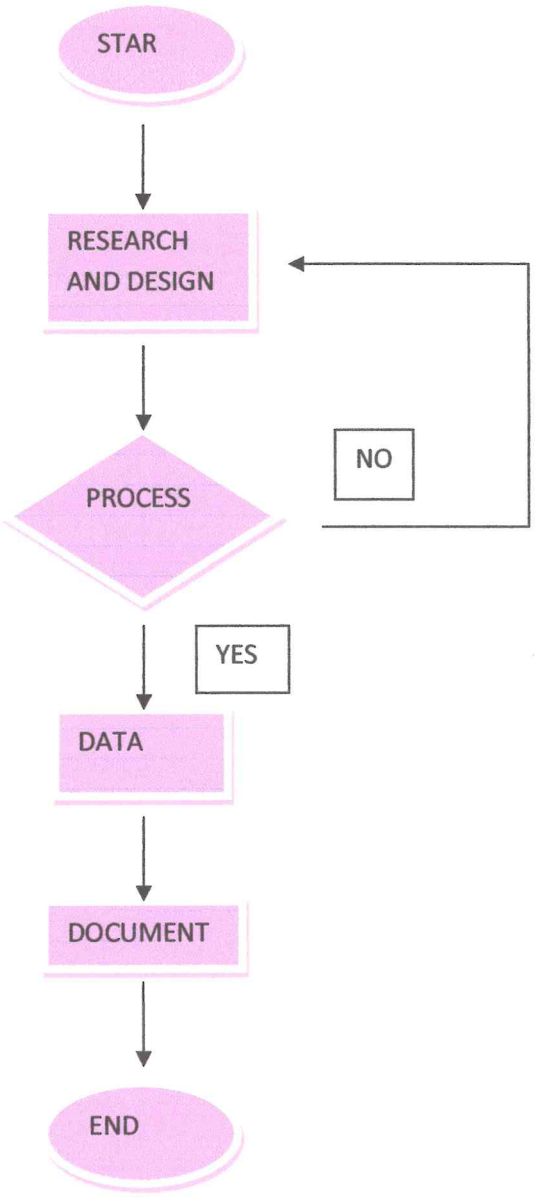


Figure 10

Every device has its own input and output. Like this project,

3.3 DESIGN OF CIRCUIT

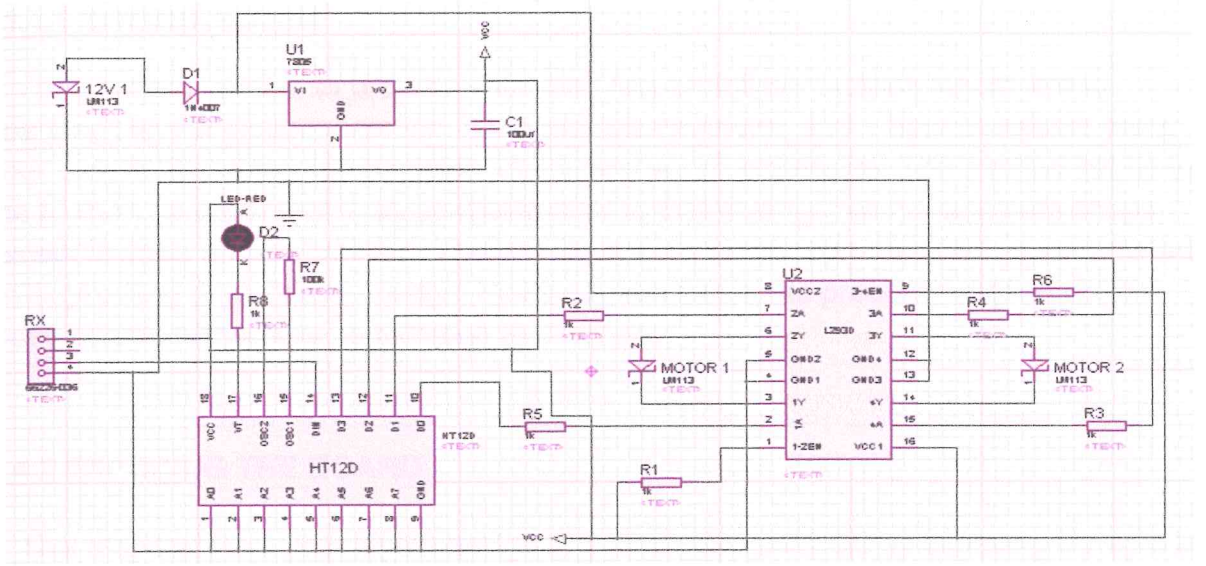


Figure11

Design of toy car using Proteus 7 Professional.

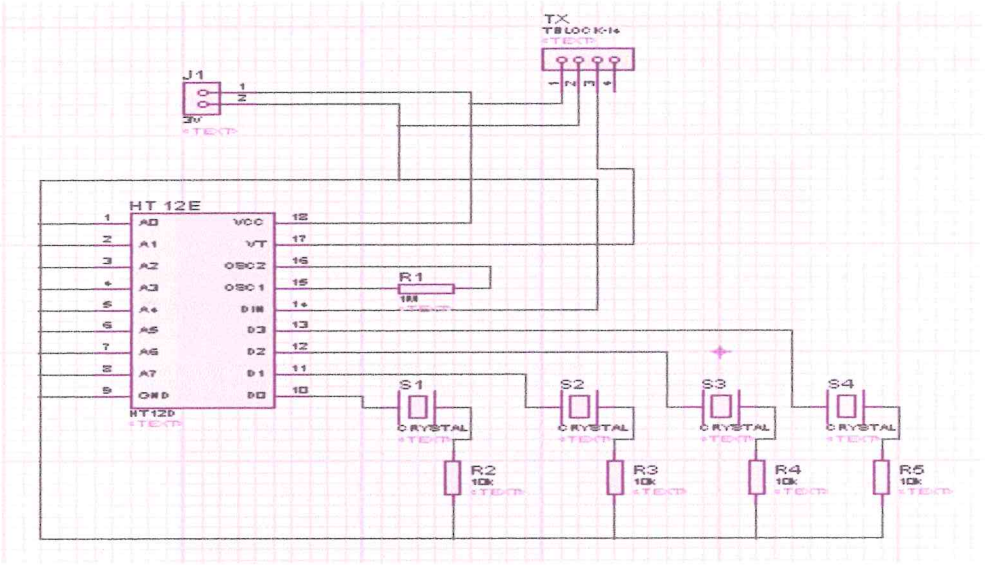


Figure 12

Design of remote control using Proteus 7 Professional.

3.4 HOW TO EACHING PCB BOARD

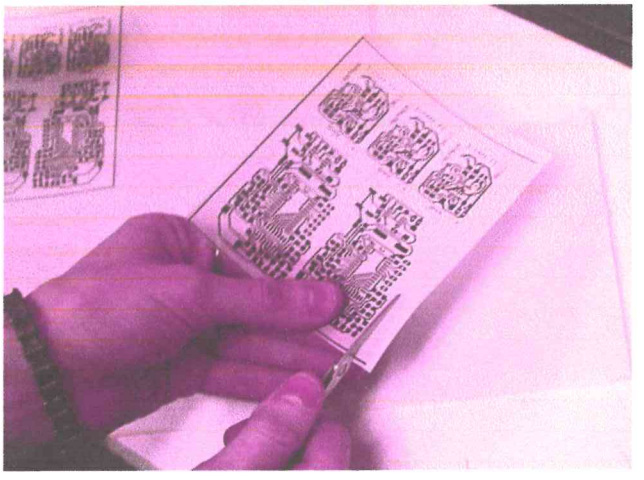
3.4.1 INTRODUCTION

For a certain number of projects, including first-prototype, surface mount 'bread boarding', layout experimentation, rapid multiple-revisions, and 1-hour deadlines doing your own PCB etching can be quick, clean, and very inexpensive. The method set up in the Media Lab basement is somewhat-similar to that of large pcb manufacture shops, except in scale and automation. There is no system for through-hole plating, automated drilling/routing or multilayer design. However, you can make precisely aligned double sided boards with simple registration techniques.

3.4.2 EXPOSING THE BOARD

This step transfers your layout design to a positive-resist PCB by exposing UV light to the sensitized PCB with the printout as a mask. For this step you will need: a presensitized positive photo resist copper clad board, scissors, tape, a UV bulb and thin plate glass or exposure unit. This step takes 5-10 minutes.

First cut out the layout leaving a few millimeters of space on the edges. If you are going to perform the exposing and etching in the same session, go ahead and turn the etching machine on now, since it takes 10 minutes to warm up.



Cut the translucent paper, leaving at least a few mm boarder

Figure 13